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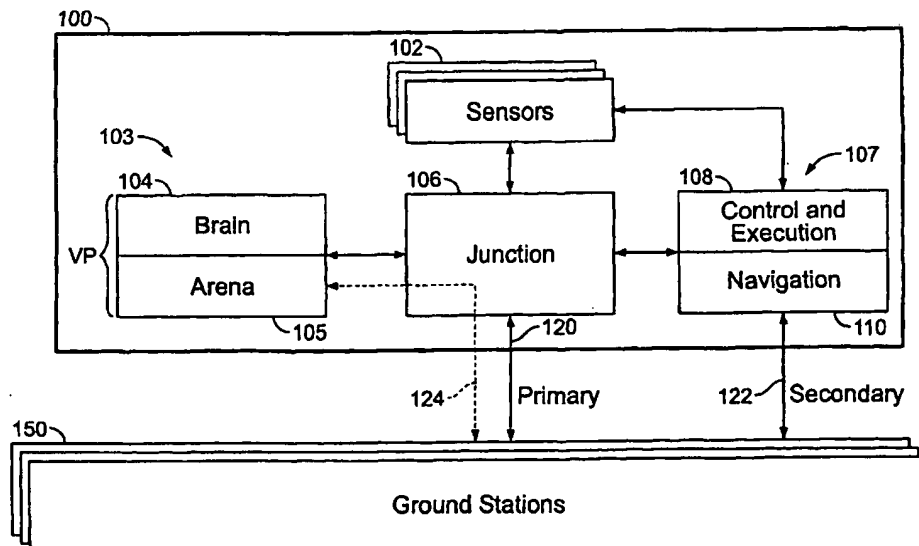
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- (54) Title: **METHODS AND APPARATUS FOR UNMANNED VEHICLE COMMAND, CONTROL, AND COMMUNICATION**



(57) **Abstract:** Methods and apparatus are provided for command and control of an unmanned vehicle ("UV"). A preferred embodiment of the invention includes a Virtual Pilot ("VP"), which includes a Brain and an Arena. The Brain includes rules governing the behavior of the UV and information on missions to be performed. The Arena includes state information about the UV and its environment. UVs in a swarm communicate with each other, as well as with various ground stations, through regular updates. Backup schemes are provided to deal with the failure of a UV module, thereby providing partial degradations in performance. Communication among the UVs and ground stations of a system employ a probabilistic scheme that promotes high spectral efficiency.

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